

# SEQUENCE LISTING

<110> COSTA E SILVA, OSWALDO DA  
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VAN THIELEN, NOCHA  
CHEN, ROUYING  
SARRIA-MILLAN, RODRIGO

<120> CELL CYCLE STRESS-RELATED PROTEINS AND METHODS OF USE  
IN PLANTS

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<140> 09/828,062

<141> 2001-04-06

<150> 60/196,001

<151> 2000-04-07

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<170> PatentIn Ver. 2.1

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<213> *Physcomitrella patens*

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<213> *Physcomitrella patens*

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Tyr Ser Ser Pro Tyr Asp Ala Gly Thr Pro Gly Thr Pro Gly Thr Pro  
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Val Ala Thr Pro Val Tyr Ala Thr Pro Val Gly Thr Pro Met Gly Thr  
100 105 110

Pro Ser Phe His Arg Gly Thr Pro Gln Tyr Lys Gln Arg Ser Glu Leu  
115 120 125

Gly Ser Gln Gly Lys Pro Leu His Arg Arg Arg Arg Ser Gln Ser Arg  
130 135 140

Glu Pro Gly His Arg Ser Pro Ser Arg Glu Pro Ser Ala Asp Gly Arg  
145 150 155 160

Pro Ser Glu Ser Ala Glu Pro Asp Asp Thr Leu Gly Gly Glu Tyr Ala  
165 170 175

Tyr Val Trp Gly Thr Asn Val Asn Ile Pro Asp Val Leu Arg Ala Ile  
180 185 190

Arg Arg Phe Leu His Asn Tyr Arg Ser Ser Ala His Asp Leu Asn Ser  
195 200 205

Lys Tyr Ile Gln Ile Ile Glu Glu Thr Val Glu Arg Glu Glu Asp Thr  
210 215 220

Leu Asn Ile Asp Met Ser Asp Ile Tyr Asp His Asp Pro Asp Leu Tyr  
225 230 235 240

Ala Lys Ile Val Arg Tyr Pro Leu Asp Ile Ile Pro Leu Leu Asp Thr  
245 250 255

Glu Cys Gln Glu Val Ala Thr Ser Leu Leu Pro Thr Phe Glu Lys His

260					265					270						
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Ile	Arg	Cys	Ser	Ser	Ile	Ile	Pro	Glu	Ile	Lys	Gly	Ala	Phe	Phe	Lys	
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Cys	Leu	Val	Cys	Gly	His	Ser	Pro	Pro	Leu	Val	Thr	Val	Val	Lys	Gly	
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Arg	Val	Glu	Glu	Pro	Thr	Arg	Cys	Glu	Lys	Pro	Glu	Cys	Ala	Ala	Arg	
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Asn	Ala	Met	Ser	Leu	Ile	His	Asn	Arg	Cys	Thr	Phe	Ala	Asn	Lys	Gln	
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370					375					380						
Pro	His	Thr	Val	Ser	Met	Cys	Leu	Tyr	Asn	Thr	Met	Val	Asp	Ala	Val	
385					390					395					400	
Lys	Pro	Gly	Asp	Arg	Ile	Glu	Val	Thr	Gly	Val	Phe	Lys	Ala	Met	Ala	
405					410					415						
Val	Arg	Val	Gly	Pro	Asn	Gln	Arg	Thr	Leu	Arg	Ala	Leu	Tyr	Lys	Thr	
420					425					430						
Tyr	Ile	Asp	Cys	Val	His	Val	Lys	Lys	Ser	Asp	Arg	Gly	Arg	Leu	Gln	
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Thr	Glu	Asp	Pro	Met	Glu	Met	Asp	Lys	Glu	Asn	Asp	Met	Tyr	Ala	Gly	
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Tyr	His	Glu	Ser	Asp	Thr	Ser	Glu	Ala	Ala	Asn	Glu	Ala	Lys	Ile	Gln	
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Lys	Leu	Lys	Glu	Leu	Ser	Lys	Leu	Pro	Gly	Ile	Tyr	Asp	Arg	Leu	Ser	
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Arg	Ser	Leu	Ala	Pro	Ser	Ile	Trp	Glu	Leu	Glu	Asp	Ile	Lys	Lys	Gly	
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Leu	Leu	Cys	Gln	Leu	Phe	Gly	Gly	Lys	Ala	Lys	Lys	Ile	Pro	Ser	Gly	
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Thr	Ser	Lys	Ser	Gln	Leu	Leu	Gln	Tyr	Val	His	Lys	Ile	Ala	Pro	Arg	
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Gly	Ile	Tyr	Thr	Ser	Gly	Arg	Gly	Ser	Ser	Ala	Val	Gly	Leu	Thr	Ala	



565										570					575				
Tyr	Val	Thr	Lys	Asp	Pro	Glu	Thr	Arg	Glu	Thr	Val	Leu	Glu	Ser	Gly				
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Ala	Leu	Val	Leu	Ser	Asp	Arg	Gly	Ile	Cys	Cys	Ile	Asp	Glu	Phe	Asp				
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Lys	Met	Ser	Asp	Asn	Ala	Arg	Ser	Met	Leu	His	Glu	Val	Met	Glu	Gln				
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Gln	Thr	Val	Ser	Val	Ala	Lys	Gly	Gly	Ile	Ile	Ala	Ser	Leu	Asn	Ala				
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Arg	Thr	Ser	Val	Leu	Ala	Cys	Ala	Asn	Pro	Ser	Gly	Ser	Arg	Tyr	Asn				
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Ala	Arg	Leu	Ser	Val	Ile	Asp	Asn	Ile	Gln	Leu	Pro	Pro	Thr	Leu	Leu				
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Ser	Arg	Phe	Asp	Leu	Ile	Tyr	Leu	Met	Leu	Asp	Lys	Pro	Asp	Glu	Gln				
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Asn	Asp	Arg	Arg	Leu	Ala	Arg	His	Leu	Val	Ala	Leu	His	Tyr	Glu	Asn				
	690					695					700								
Tyr	Glu	Val	Ser	Lys	Gln	Asp	Ala	Leu	Asp	Leu	Gln	Thr	Leu	Thr	Ala				
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Ala	Ala	Glu	Asp	Leu	Ile	Asn	Gly	Tyr	Val	Glu	Met	Arg	Gln	Lys	Gly				
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Asp	Val	Ala	Leu	Gln	Gln	Ser	Ala	Thr	Asp	His	Ala	Thr	Gly	Thr	Ile				
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865		870		875		880									
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 35 40 45  
 Ser Ala Ser Gly Lys Asn Asp Asn Gly Val Val Glu Asp Val Asp Met  
 50 55 60  
 Gly Lys Arg Gly Met Leu Lys Gly Val Ala Gly Ala Leu Ala Ala Val  
 65 70 75 80  
 Leu Pro Ala Val Ile Ala Lys Lys Ala Ser Ala Ala Glu Glu Gln Gly  
 85 90 95  
 Val Ala Ser Ser Arg Met Ser Tyr Ser Arg Phe Leu Glu Tyr Leu Asp  
 100 105 110  
 Met Asp Arg Val Lys Lys Val Asp Leu Tyr Glu Asn Gly Thr Ile Ala  
 115 120 125  
 Ile Val Glu Ala Val Ser Pro Glu Leu Gly Asn Arg Val Gln Arg Val  
 130 135 140  
 Arg Val Gln Leu Pro Gly Thr Ser Ser Glu Leu Leu Ser Lys Phe Arg  
 145 150 155 160  
 Ser Lys Asn Val Asp Phe Ala Ala His Ser Pro Gln Glu Asp Ser Gly  
 165 170 175  
 Ser Val Ile Leu Asn Leu Ile Gly Asn Leu Ala Phe Pro Leu Leu Leu  
 180 185 190  
 Val Gly Gly Leu Phe Phe Leu Ser Arg Arg Ser Gln Gly Gly Met Gly  
 195 200 205  
 Pro Gly Gly Pro Gly Asn Pro Met Ala Phe Gly Lys Ser Lys Ala Lys  
 210 215 220

Phe	Gln	Met	Glu	Pro	Asn	Thr	Gly	Ile	Thr	Phe	Gln	Asp	Val	Ala	Gly	
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Val	Asp	Glu	Ala	Lys	Gln	Asp	Phe	Met	Glu	Val	Val	Glu	Phe	Leu	Lys	
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Arg	Pro	Glu	Arg	Phe	Thr	Ala	Val	Gly	Ala	Lys	Ile	Pro	Lys	Gly	Val	
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Leu	Leu	Val	Gly	Pro	Pro	Gly	Thr	Gly	Lys	Thr	Leu	Leu	Ala	Lys	Ala	
		275					280					285				
Ile	Ala	Gly	Glu	Ala	Gly	Val	Pro	Phe	Phe	Ser	Ile	Ser	Gly	Ser	Glu	
	290					295					300					
Phe	Val	Glu	Met	Phe	Val	Gly	Val	Gly	Ala	Ser	Arg	Val	Arg	Asp	Leu	
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Phe	Lys	Lys	Ala	Lys	Glu	Asn	Ala	Pro	Cys	Ile	Val	Phe	Val	Asp	Glu	
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Ile	Asp	Ala	Val	Gly	Arg	Gln	Arg	Gly	Thr	Gly	Ile	Gly	Gly	Gly	Asn	
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Asp	Glu	Arg	Glu	Gln	Thr	Leu	Asn	Gln	Leu	Leu	Thr	Glu	Met	Asp	Gly	
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	370					375					380					
Asp	Ile	Leu	Asp	Ala	Ala	Leu	Leu	Arg	Pro	Gly	Arg	Phe	Asp	Arg	Gln	
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Val	Ser	Val	Asp	Val	Pro	Asp	Val	Lys	Gly	Arg	Thr	Asp	Ile	Leu	Lys	
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Val	His	Ala	Ser	Asn	Lys	Lys	Phe	Ala	Asp	Asp	Val	Ser	Leu	Asp	Ile	
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Leu	Asn	Glu	Ala	Ala	Ile	Leu	Thr	Gly	Arg	Arg	Gly	Lys	Thr	Ala	Ile	
	450					455					460					
Ser	Ala	Lys	Glu	Ile	Asp	Asp	Ser	Ile	Asp	Arg	Ile	Val	Ala	Gly	Met	
465					470					475					480	
Glu	Gly	Thr	Val	Met	Thr	Asp	Gly	Lys	Ser	Lys	Ser	Leu	Val	Ala	Tyr	
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His	Glu	Val	Gly	His	Ala	Ile	Cys	Gly	Thr	Leu	Thr	Pro	Gly	His	Asp	
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Ala	Val	Gln	Lys	Val	Thr	Leu	Ile	Pro	Arg	Gly	Gln	Ala	Arg	Gly	Leu	
		515					520					525				

Thr Trp Phe Ile Pro Gly Glu Asp Pro Thr Leu Ile Ser Lys Gln Gln  
 530 535 540  
 Ile Phe Ala Arg Ile Val Gly Ala Leu Gly Gly Arg Ala Thr Glu Gln  
 545 550 555 560  
 Val Val Phe Gly Asp Ala Glu Val Thr Thr Gly Ala Ser Ser Asp Leu  
 565 570 575  
 Gln Gln Val Thr Ser Met Ala Lys Gln Met Val Thr Val Phe Gly Met  
 580 585 590  
 Ser Asp Ile Gly Pro Trp Ala Leu Met Asp Pro Ser Ser Gln Gly Gly  
 595 600 605  
 Asp Met Ile Met Arg Met Met Ala Arg Asn Ser Met Ser Glu Lys Leu  
 610 615 620  
 Ala Glu Asp Ile Asp Lys Ala Val Lys Ala Ile Ser Asp Glu Ala Tyr  
 625 630 635 640  
 Glu Val Ala Leu Gly His Ile Arg Asn Asn Arg Thr Ala Met Asp Lys  
 645 650 655  
 Ile Val Glu Val Leu Leu Glu Lys Glu Thr Leu Ser Gly Ala Glu Phe  
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18

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